

Valves and Liners.—Piston valves are now exclusively used for high-speed engines. In many cases they are quite solid and have no packing rings whatever. The valves are finished to size in a grinding machine with several water grooves turned in the faces. The usual practice, however, is for the active part of the valve to be made as a floating ring with plain faces held in position by light end rings secured by studs in the body of the valve. The body casting should be as simple as possible in order to avoid the distorting effect of ribs. Some manufacturers make the body of the valve a plain open cylinder without any ribs whatever, the floating rings at the end being kept in position by strong caps which are in turn secured between the collar on the valve rod and the nuts at the end. It is better, however, to secure the end caps to the valve body by studs, as the parts of the other design have to be inserted or taken out of the valve chest separately. In cases where Ramsbottom or other forms of expanding rings are fitted, it

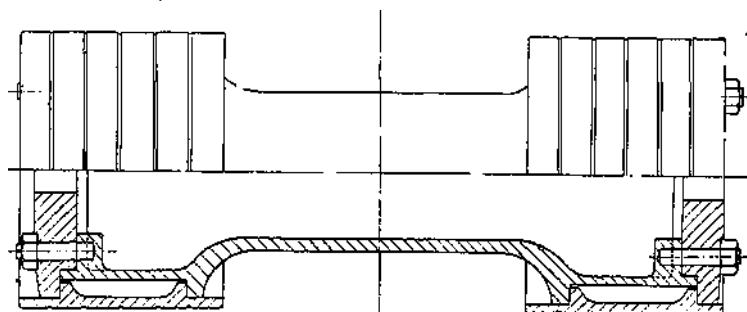


Fig. 38.—Piston Valve for High-speed Engine

is necessary to use liners in the valve chest. These are pierced with holes in order to communicate with the steam port. The bars between the openings should be placed at an angle to the axis in order to prevent local wear on the valve rings. The presence of a liner necessarily causes a certain drop in the initial pressure in the cylinder, and for this reason many designers prefer to dispense with liners, using, of course, solid valves or floating solid rings.

In the early days of the double-acting high-speed engine a single valve to serve both high-pressure and low-pressure cylinders in compound engines was arranged in a chest between them. It had two portions threaded on a common valve spindle driven from one eccentric. The

high-pressure end
of the valve had usually " inside " admission and the low-pressure end
" outside " admission, the two cranks being, of course, opposite to each other. The valves were hollow, and the exhaust steam from the outer high-pressure port passed through both portions of the valve to the outer low-pressure port. This design is not now so commonly used, as it is found much better from the point of view of economy for each cylinder to have its own valve, the exhaust passing from the high-pressure to the low-pressure through an external pipe which is, of course, well lagged to prevent condensation. Belliss & Morcom have introduced a type of engine having a valve for each cylinder.